User's Manual

SP-6VA1S

Mini Scaler Switcher

Table of Contents

Introduction 1
Product Appearance 2
System Connection 4
System Operations 5
Specification 14
Advanced Function 14
Video and Audio Signal Introduction 16
Panel Drawing 18
Troubleshooting & Maintenance 19
Safety Operation Guide 20
Warranty 21

Introduction

1.1 Introduction to SP-6VA1S

SP-6VA1S is a full HD scaler switcher with 6 video & 3 audio inputs, it scales & switches any video signal HDMI, VGA, YPbPr, C-Video & S-video to HDMI up to 1080P.

It is controllable via the IR and RS232 buttons. The SP-6VA1S is a high performance switcher scaler for educational institutions, meeting rooms, conference rooms, etc.

1.2 Features

- 6 video Inputs: 2 x HDMI, 1 x VGA, 1 x YPbPr, 1 x C-video & 1 x S-video, and upscale to HDMI output at 1080P
- Support VGA resolutions: 640x480, 800x600, 1024x768, 1280x1024, 1280x768, 1360x768@60Hz, 1920x1080
- Built-in PAL/NTSC and audio format automatic identification technologies, with good video and audio processing technology for high performance
- Output display H/V size: adjustable to resolve any overscale issue
- Output display H/V position moveable
- Picture/MP3 display via USB
- Video parameter setting and preset
- Powerful OSD function with full control, support output freeze function
- Built-in break-point memory and power-off protection function
- HDMI1.3 and HDCP compatible
- Firmware upgradeable via USB
- Front panel lockout
- Controllable via button, IR & RS232

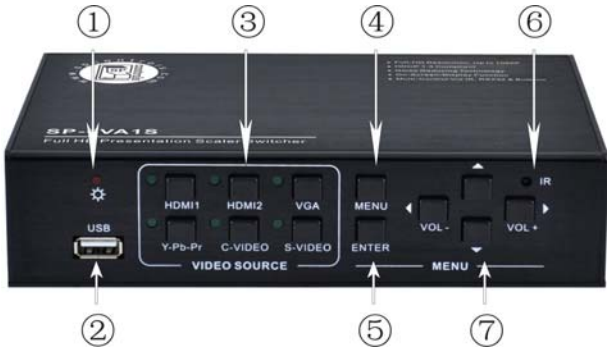
1.3 Package Contents

- 1 x SP-6VA1S
- 2 x Mounting ears
- 1 x IR remote (battery not included)
- 1 x Power adapter (DC 12V)
- 4 x Screws
- 1 x RS232 cable
- 1 x User Manual

Notes：Please confirm if the product and the accessories are all included, if not, please contact with the dealers.

Product Appearance

1.4 SP-6VA1S Front Panel



1 Power indicator
It will show as red when the unit is connected with power.

2 USB input
It can work as the USB flash disk, support the JPEG picture presentation playing, and MP3 audio playing. It is operated by the on-screen display.

It can work as the firmware updating port (connect to computer via USB cable).

3 Video source selection buttons
You can select the video/audio source by these six buttons: HDMI1, HDMI2, VGA, YPbPr, C-VIDEO and S-VIDEO.

4 MENU button
To active OSD (on-screen display), works with the direction key. When pressed, it will enter into the Picture setting, Audio setting, System setting and USB setting mode. The MENU button also can cancel the last operation.

5 ENTER button
This button works with the MENU button and the direction key. When pressed, it can confirm the setting parameter.
When in USB mode, the ENTER button also acts as the confirm function.

6 IR sensor
Receives the signal from the IR remote.

7 Direction key
When entering into OSD mode, the four buttons will active. When OSD is off, only the left button and the right button can be used for controlling the volume (VOL-, VOL+).

1.5 SP-6VA1S Rear Panel

1 **Power port:** Connects with the 12VDC power.

2 **RS232 control port:** connects with a control device, such as a computer.

3 **HDMI1 & HDMI2:** HDMI inputs.

4 **VGA & stereo audio input:**
- VGA: VGA input supports different resolutions and format.
- AUDIO: Stereo audio input.

5 **YPbPr, L&R:**
- YPbPr: Component video YPbPr input.
- L&R: Analog audio input (Left and Right channel).

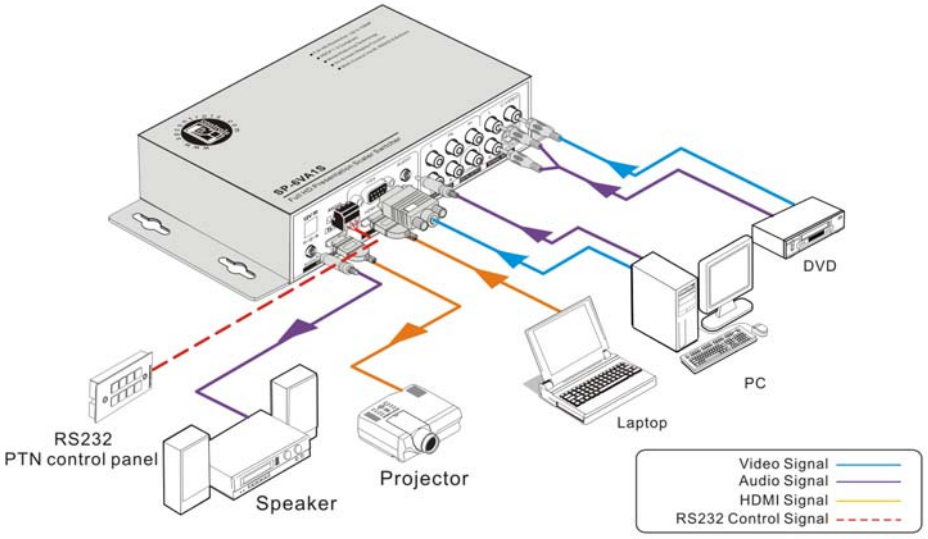
6 **C-VIDEO, L&R, S-VIDEO:**
- C-VIDEO: Composite video input.
- L&R: Analog audio input (Left and Right channel).
- S-VIDEO: Separate video input, shares the same stereo audio with C-video.

7 **DIGITAL OUTPUT:**
- Coax: Coaxial audio output, with SPDIF format.

8 **OUTPUTS:**
- AUDIO: Stereo audio output. All the input audio will be switched to this output, including the embedded HDMI audio.
- HDMI: HDMI output. Embedded digital audio, with adjustable volume.

System Connection

1.6 System Diagram



1.7 Usage Precautions

1) System should be installed in a clean environment and has proper temperature and humidity.

2) All of the power switches, plugs, sockets and power cords should be insulated and safe.

3) All devices should be connected before power is turned on.

1.8 Application

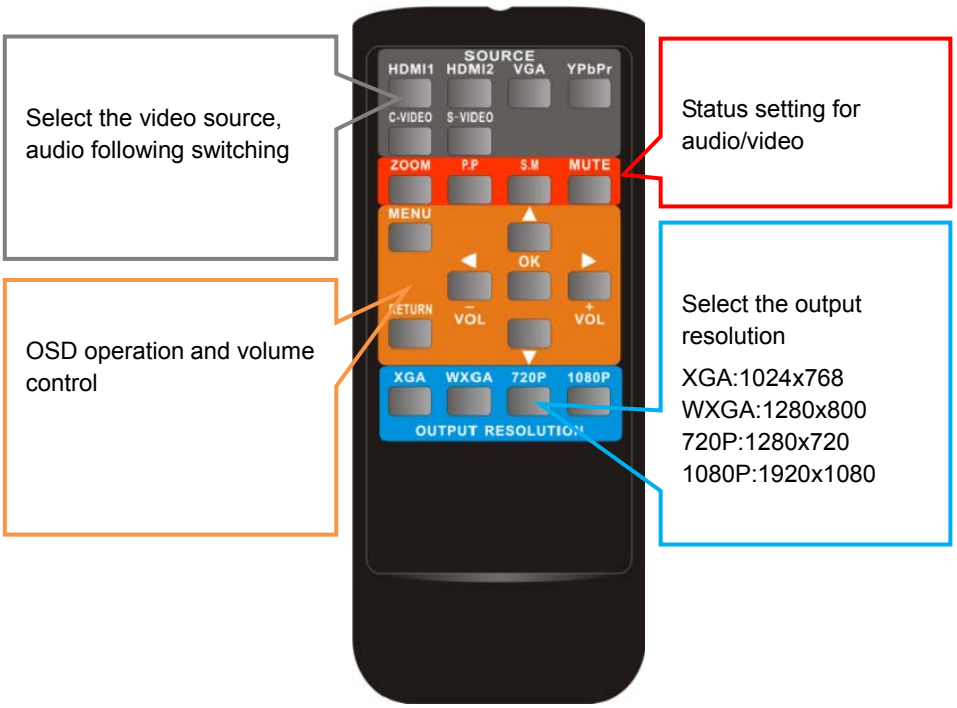
The SP-6VA1S is good for various applications such as Broadcast, multi-media meeting rooms, large screen displays and command & control centers, etc.

System Operations

1.9 Operations of Buttons

Module	Button	Description
VIDEO SOURCE	HDMI1	Switching to HDMI1 input
	HDMI2	Switching to HDMI2 input
	VGA	Switching to VGA input
	YPBPR	Switching to YPbPr input
	C－VIDEO	Switching to C-video input
	S－VIDEO	Switching to S-video input
MENU	MENU	MENU button, to activate OSD (on-screen display) for using the direction keys. When pressed, it will enter into the Picture setting, Audio setting, System setting and USB setting mode. The MENU button will also cancel the last operation.
	ENTER	ENTER button works with the MENU button and the direction keys. When pressed, it will confirm the setting parameter.
	↑ ↓ ← →	When using the Direction keys in OSD mode, all four buttons are active. When OSD is off, only the left button and the right button can be used for controlling the volume (VOL-, VOL+).

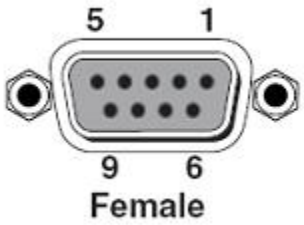
1.10 Operations of IR Remote


Select the video source, audio following switching
OSD operation and volume control
Status setting for audio/video
Select the output resolution
XGA:1024x768
WXGA:1280x800
720P:1280x720
1080P:1920x1080
SOURCE
HDMI1
HDMI2
VGA
YPbPr
C-VIDEO
S-VIDEO
ZOOM
P.P
S.M
MUTE
MENU
OK
RETURN
VOL
VOL
XGA
WXGA
720P
1080P
OUTPUT RESOLUTION

1.11 Operation of Control Software

1.11.1 RS232 Connection with Computer

When SP-6VA1S connects to the COM1 or COM2 of the computer with control software, users can control it by that computer.
To control the scaler switcher, users should use a 3-pole male captive screw to 9-pin HD female connector and use the public COM software.
The definition of its pins is as the table below:



No.	Pin	Function
1	N/u	Unused
2	Tx	Transmit
3	Rx	Receive
4	N/u	Unused
5	Gnd	Ground
6	N/u	Unused
7	N/u	Unused
8	N/u	Unused
9	N/u	Unused

1.11.2 Installation/uninstalling of RS232 Control Software

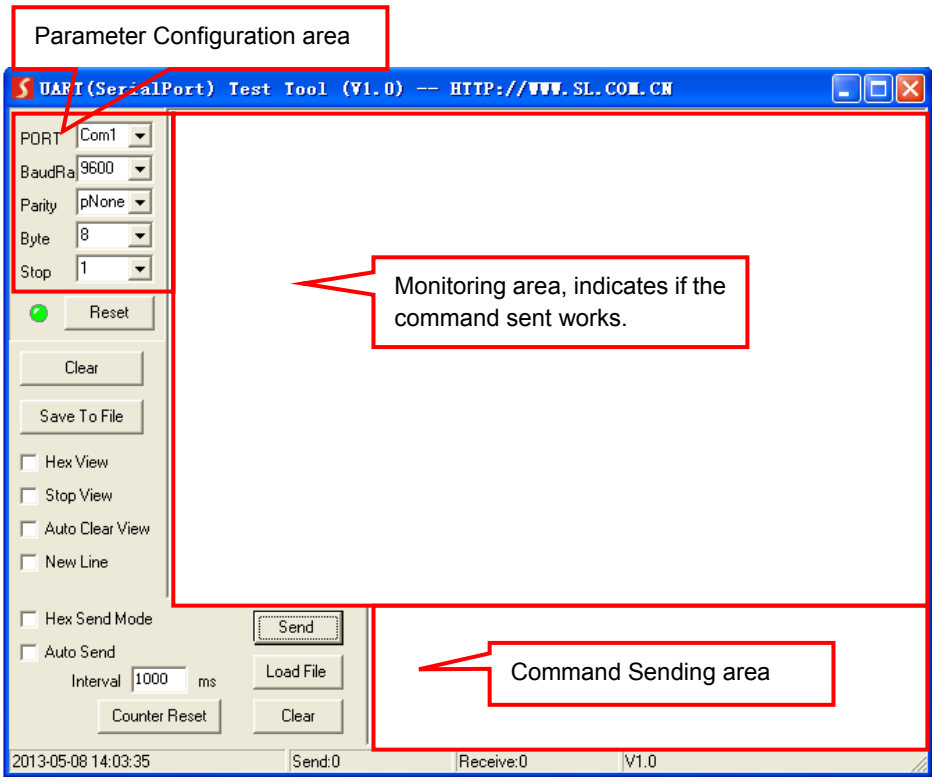
- **Installation:** Copy the control software file to the computer which is connected with SP-6VA1S.
- **Uninstalling:** Delete all the control software files in corresponding file path.

1.11.3 Basic Settings

First to connect SP-6VA1S with all input source devices and output displaying devices needed, then to connect SP-6VA1S with a computer which is installed with RS232 control software. Double-click the software icon to run this software.

Here we take the software **CommWatch.exe** as example. The icon is showed as below:

The interface of the control software is showed as below:



Please set the parameters of COM number, bound rate, data bit, stop bit and the parity bit correctly, and then you are able to send command in Command Sending Area.

1.11.4 RS232 Communication Commands

Communication protocol: RS232 Communication Protocol
Baud rate: 9600 Data bit: 8 Stop bit: 1 Parity bit: none

Command	Function	Feedback Example
0600%	MUTE	Mute On
0601%	UnMute	Mute Off
0602%	Audio volume up	Volume: XX
0603%	Audio volume down	Volume: XX
0604%	Lock the front panel button	Panel Locked
0605%	Unlock the front panel button	Panel UnLocked
01XX%	Preset the volume. The XX is ranging from 00 to 99	Volume: XX
02XX%	Preset the brightness. The XX is ranging from 00 to 99	Brightness: XX
03XX%	Preset the contrast. The XX is ranging from 00 to 99	Contrast: XX
04XX%	Preset the saturation. The XX is ranging from 00 to 99	Saturation: XX
05XX%	Preset the sharpness. The XX is ranging from 00 to 07	Sharpness: XX
0606%	Auto-adjust the input parameter(VGA only)	VGA Adjustment
0607%	Auto-adjust the color temperature	Color Temp: XX
0608%	ZOOM the image, set the aspect ratio	Aspect Ratio: XX
0609%	OK, for OSD selection	OK
0610%	Left of OSD or volume up when not in OSD menu mode	Left
0611%	Right of OSD or volume down when not in OSD menu mode	Right
0612%	Up of OSD	Up
0613%	Down of OSD	Down
0614%	set the picture mode	Picture Mode : XX
0615%	SM Mode	Sound Mode: XX
0616%	MENU of OSD	MENU
0617%	Reset to factory defaults	Factory reset
0620%	Switching to HDMI1 input	Source: HDMI 1
0621%	Switching to HDMI2 input	Source: HDMI 2
0622%	Switching to VGA input	Source: VGA
0623%	Switching to YPbPr input	Source: YPbPr
0624%	Switching to S-Video input	Source: SVIDEO

0625%	Switching to composite video input	Source: CVIDEO
0626%	Change the resolution to 1024X768 XGA	Resolution: XGA 1024X768
0627%	Change the resolution to 1280X720 720P	Resolution: 720P 1280X720
0628%	Change the resolution to 1280X800 WXGA	Resolution: WXGA 1280X800
0629%	Change the resolution to 1920X1080 1080P	Resolution: 1080P 1920X1080
0630%	Check the volume level	Volume: XX
0631%	Check the input source	Source: XXXXXX
0632%	Check the output resolution	Resolution: XXXXXXXX
0633%	Check the image mode	Picture Mode : XX
0634%	Check the audio mode	Sound Mode: XX
0635%	Check the image aspect ratio	Aspect Ratio: XX
0636%	Check the brightness	Brightness: XX
0637%	Check the contrast	Contrast: XX
0638%	Check the saturation	Saturation: XX
0639%	Check sharpness	Sharpness: XX
0640%	Check the color temperature	Color Temp: XX
0699%	Check the firmware version	SP-6VA1S V XXXXX
0644%	Enable OSD CHANNEL display	OSD Source: Display
0645%	Disable OSD CHANNEL display	OSD Channel (Source):No Display
0646%	Enable Volume Bar display	Volume Bar: Display
0647%	Disable Volume Bar display	Volume Bar: No Display
0648%	Enable Digital audio（HDMI and SPDIF ）output	Digital Sound Ouput: Enable
0649%	Disable digital audio (HDMI and SPDIF) output	Digital Sound Ouput: Disable
0650%	Check OSD CHANNEL display status	OSD Source: Display
0651%	Check Volume Bar display status	Volume Bar: Display
0652%	Check Digital audio output status	Digital Sound Ouput: Enable
0655%	Freeze output image	Freeze: Enable
0656%	Cancel the freezing of output image	Freeze: Disable

1.12 Firmware Update

SP-6VA1S supports firmware field-updating, by USB flash disk. The Operation is:

1) Copy the file "**MT23ATV.bin**" to a USB flash disk. (The "**MT23ATV.bin**" file is provided/authorized by SP CONTROLS engineering department)
2) Plug the USB flash disk to the SP-6VA1S USB port on its front panel.
3) Press the button "MENU" for 15 seconds or more, until it comes out an update OSD.
4) The SP-6VA1S will capture the new firmware from USB flash disk.
5) After update to the new firmware, reboot and send the command "**0617%**" to restore to factory settings.
6) After that, reboot again.

Notice: If send the RS232 command to restore factory setting is unsuccessful, please change the baud rate to 115200 and try again.

Advanced Function

The SP-6VA1S provides an OSD operation menu, with various functions and languages.

1.13 Picture Setting

The first icon from left of OSD menu is to set the picture parameter. It includes the pictures mode preset, color temperature, contrast, brightness, hue, saturation, sharpness, scale, and Advance picture adjust.

Some parameters are available depending on different input. The Advance Picture Adjust can set the Digital Noise Reduction, dynamic color, skin tone and Adaptive Luma adjustment function on or off. And DNR is suggested to be on, it can make the output image clear and smooth.
Please check the picture below:

1.14 Audio Setting

The Second icon from left of OSD menu is to set the audio/sound parameter. It includes the sound effect preset, bass, treble, balance, scene mode, surround and smart volume setting. Some parameters are available depending on different input.
Please check the picture below:

1.15 System Setting

The Third icon from left of OSD menu is the system setting. It includes the OSD language setting, Listen, output image freeze, VGA setting, output adjustment and output resolution change.
Listen: Audio output only. To resume video output, please press button “MENU”.
VGA setting: Adjust the H/V signal of VGA input, includes auto adjustment.
Output adjustment: Adjust H/V size and H/V position of the output. This function is available only with HDMI and VGA inputs.

1.16 Operations of USB Menu

The last icon from left of OSD menu is the USB operation menu. You can enter the USB flash disk, to play music and picture. And, you can set the picture presentation order, and picture presentation speed.

When you enter this page, you can select the file from USB flash disk, which is plugged into the SP-6VA1S. You can use the up/down/left/right buttons to control it.

The USB can play MP3 music and JPG picture. And it can show the lyric of MP3 file, if the lyric is in the same folder of MP3 file. The lyric should be in .LRC format:

\
My Pictures
the day you went
Call me blind
To still be suffering is stupid after all of this time
Did I lose my love to someone better
And does she love you like I do
I do, you know I really really do
Name the day you went.mp3
Size 1640 KB
00:49 / 03:30
PREV NEXT REW FF PAUSE DIR LISTEN EXIT

NOTE:

1 When you are in the USB folder page, the ENTER button is for confirm function. When use the IR remote, the OK button is for confirm function. The button “Menu” is the return function. The RETURN button on the IR remote is for return function.

2 When the resolution is 1024x768, it does not support the USB flash disk.

3 When the resolution is changed, the OSD menu will be off.

Specification

Video Input		Video Output	
Input	2 HDMI, 1 VGA, 1 YPbPr 1 C-Video1 S-Video 1 USB multimedia input	Output	1 HDMI
Input Connector	Female HDMI Female VGA(15 pin HD) Female RCA 4 pin mini DIN connector USB-A connector	Output Connector	HDMI female connector
Video Signal	HDMI 1.3/DVI, VGA, RGBHV, RGBs, RGsB, RsBsGs, NTSC 3.58, NTSC 4.42, PAL, SECAM MPEG / AVI / JPG for USB input	Video Signal	HDMI
Video General			
Resolution Range	1080P, 1920*1080 ; 720P, 1280*720; WXGA,1280*800 ; XGA, 1024*768.	Bandwidth	HDMI:4.95Gbps(1.65Gbps per color) C-Video/S-Video:150MHz YPbPr: 170MHz VGA: 375MHz
Maximum Pixel Clock	145MHz	Video Impedance	75Ω
VGA Cross Talk	-50dB@5MHz	Input / Output Level	0.5V~2.0Vp-p
Gain	0dB	HDCP	Compliant with DVI & HDMI 1.3 standards
Audio Input		**Audio output**	
Input	1 Dual-mono stereo audio for YPbPr 1 Dual-mono stereo audio for C-VIDEO and S-VIDEO 1 3.5mm stereo audio 2 digital HDMI	Output	1 3.5mm stereo audio 1 COAX and HDMI audio

	embedded audio		
Input Connector	2 RCA (L&R) for YPbPr 2 RCA (L&R) for C-Video & S-Video audio 1 3.5mm jack for VGA audio 2 HDMI for embedded audio	Output Connector	1 3.5mm jack for line audio 1 RCA for CO-AX audio (SPDIF) 1 HDMI for embedded audio
Input Impedance	>10kΩ	Output Impedance	50Ω
Audio General			
Frequency Response	20Hz~20K Hz	Stereo Channel Separation	>80dB @1KHz
CMRR	>90dB @20Hz to 20K Hz		
Control Parts			
Control/ Remote	IR remote, Buttons & RS232	Pin Configuration	2 = TX, 3 = RX, 5 = GND
General			
Temperature	-20 ~ +70□	Humidity	10% ~ 90%
Power Supply	DC12V adapter	Power Consumption	6W
Case Dimension	W182x H42x D104mm	Product Weight	0.5Kg

Video and Audio Signal Introduction

1.17 Video Signal

SP-6VA1S supports a wide range of video signals, such as C-Video, S-Video, YPbPr, VGA and HDMI. And all can be scaled to high-resolution HDMI format and switched to output on HDMI.

1.17.1 C-Video and S-Video input

- Supporting PAL/SECAM/NTSC format
- Changeable aspect ratio. (Full-screen, wide screen, 4:3)
- Color RGB adjustable

1.17.2 YPbPr input

Aspect ratio adjustment (Full-screen, wide screen, 4:3):

Input Resolution	Display Parameter				
	Frame frequency		Frame frequency		Frame frequency
720×480 I	2:1	525	15.75	60	4:3
720×480 P	1:1	525	31.5	60	4:3
720×576 I	2:1	625	15.625	50	4:3
720×576 P	1:1	625	31.25	50	4:3
1280×720P	1:1	750	45	60	16:9
1280×720P	1:1	750	37.50	50	16:9
1920×1080 I	2:1	1125	28.125	50	16:9
1920×1080 I	2:1	1125	33.75	60	16:9
1920×1080 I	2:1	1250	31.25	50	16:9
1920×1080 p	1:1	1250	62.5	50	16:9
1920×1080 p	1:1	1250	67.5	60	16:9
The bandwidth is up to170MHz					

1.17.3 VGA input

The VGA resolution is VESA standard, supporting:

No.	Resolution	No.	Resolution	No.	Resolution
1	640×480@60 Hz	6	800×600@75 Hz	11	1280×768
2	640×480@72 Hz	7	1024×768@60 Hz	12	1360×768@60 Hz
3	720×400@70 Hz	8	1024×768@70 Hz	13	1920×1080
4	800×600@60 Hz	9	1024×768@75 Hz		
5	800×600@72 Hz	10	1280×1024@75 Hz		

- The bandwidth is up to 375MHz (-3dB).
- The following audio can adjust bass/treble
- Aspect ratio adjustment. (Full-screen, 4:3)

1.17.4 HDMI input

HDMI resolution support:

No.	Resolution	No.	Resolution	No.	Resolution
1	640×480@60Hz	8	1024×768@60 Hz	15	1600×900@60Hz
2	640×480@72Hz	9	1024×768@70 Hz	16	1600×1200@60Hz
3	640×480@75Hz	10	1024×768@75 Hz	17	1920×540

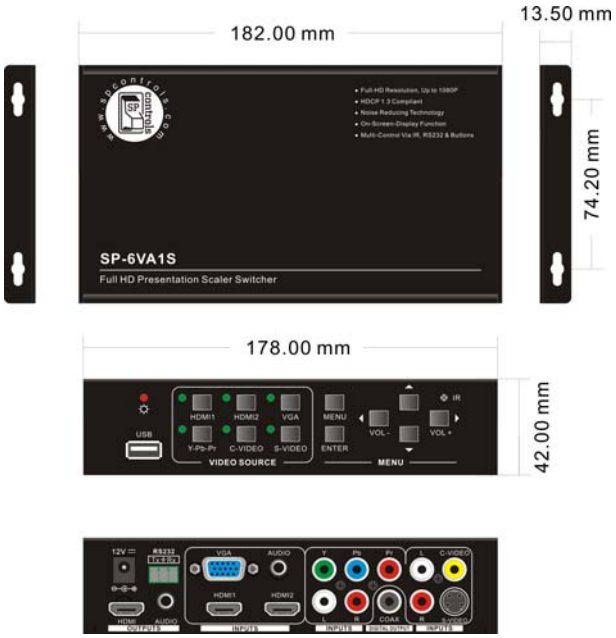
4	800×600@56Hz	11	1280×720P	18	1920×1080I
5	800×600@60 Hz	12	1280×1024@75Hz	19	1920×1080P
6	800×600@72 Hz	13	1280×800@60Hz	20	1920×1200@60Hz
7	800×600@75Hz	14	1360×768		

- Digital embedded audio decoding.
- Aspect ratio adjustment (Full-screen, wide screen, 4:3, auto-adjust).
- Support HDCP1.3, compatible with DVI signal.

1.18 Audio Signal

- 3 Stereo audio input & 2 HDMI embedded audio input
- 3 simultaneous outputs. 3.5mm stereo audio, COAX (SPDIF), and HDMI embedded audio.
- Volume/Bass/Treble adjustable
- Audio status presets

Panel Drawing



Troubleshooting & Maintenance

1) When images of terminal unit output with ghost, such as the projector output with ghost. Generally this is not a faulty unit; this may be caused by an incorrect setting on the projector or a bad cable. Please check the projector's setting or try another high quality connection cable.

2) When there is a color loss or no video signal output, check the input and output end connections of the cables.

3) When the IR remote doesn't work, check the battery and replace with a new one.

4) When user cannot control the switcher by computer through its COM port, check the COM port number in the software and make sure the COM port is correct.

5) If the **POWER** indicator doesn't work or does not respond to any operation, please make sure the power cord connection is good.

6) When there is no output image or audio while there is feedback from RS232 command:

- The audio/video connector is loose, please connect again.
- The audio/video connector has a broken circuit or a short circuit inside it. Please replace the cable.
- Check if there is any signal at the input/output end. You can check it by using an oscilloscope or a multimeter.

7) If the static becomes stronger when connecting the BNC connectors, it is probably due to the incorrect grounding, please correct it otherwise it would damage the switcher.

8) If the switcher cannot be controlled by the buttons on the front panel, RS232 port or IR remote, the switcher may have broken. Contact our tech support department at help@spcontrols.com.

Safety Operation Guide

In order to guarantee the reliable operation of the equipment, please abide by the following installation and maintenance guidelines:

1) The system must be mounted properly. Please use 3-prong plugs and an alternating power supply ranging from 100v to 240v and from 50Hz to 60Hz.

2) Store device at room temperature (not very hot or very cold).

3) As the unit generates heat when running, the working environment should have adequate ventilation to avoid damage caused by overheating.

4) Cut off the general power switch in humid weather, or if left unused for long time.

5) Before using, ensure that the alternating current wire is pulled out of the power supply:

- Take off or reship any components of the equipment.
- Take off or rejoin any pin or other link of the equipment.

6) DO NOT try to open the casing of the equipment, DO NOT repair it on your own in case of injury, or causing damage to the equipment.

7) DO NOT splash liquid in or around the equipment.

Warranty

1) We offer a three-year warranty on the SP-6VA1S from the date of purchase.

2) Warranty repair or replacement will not apply if the unit is:

- Beyond the warranty period.
- Damaged due to incorrect usage, storage or repaired by user.
- Damaged caused by force majeure.

All returns require prior authorization. To obtain a return authorization, contact our technical support department at (877) 367-8444 ext. 302 or email help@spcontrols.com.

SP Controls, Inc.
Tel: (650) 392-7880
Toll Free (US): (877)-367-8444
Email: help@spcontrols.com
Website: www.spcontrols.com